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I. *An Account of the Earthquakes in Sicilia, on the Ninth and Eleventh of January, 169 $\frac{2}{3}$. Translated from an Italian Letter wrote from Sicily by the Noble Vincentius Bonajutus, and Communicated to the ROYAL SOCIETY by the Learned Marcellus Malpighius, Physician to his present Holiness.*

THE Great Secrets of Nature are so inscrutable, that we find them far out of our reach whenever we go about to form a true and nice Judgment of them; nor is the Task less difficult to discover the Effects of Portentous Events, divers Accidents being often confounded with the Effects themselves, and one Cause enchained with and depending on another. With these Difficulties I find my self encompassed in this Relation which you have commanded from me of the Natural Events and Effects of the late Earthquake, of which there are some whereof we yet are in suspense, whence they were caused, or whether they sprung from a hidden Principle, or blind Chance. These Doubts obliged me to relate all, and lay the whole before you, that your Prudent and Searching Judgment may choose out such as may seem most likely to satisfy the Desires of *Signior Marcello Malpighi*, and leave the rest as only Niceries of less Value.

The

The continual Fiery Eruptions of *Ætna* (of which the first that we have any Account of, happened 500 Years before the Destruction of *Troy*, as *Diodorus Siculus* relates) have been taken for the most likely Causes of the horrible shakes that from time to time have laid waste the Island of *Sicilia*, as is observed by *Faxello*, in the first Decade in the 1st. Book, Cap. 4. and in the 10th. Book of the last Decade. Where he remembers that of the Year 1542. which on the 10th. of *December* at the 23d. hour shook the whole Island, and especially *Val di Noto*, *Syracusa*, *Lentini*, *Sortini*, *Mililli*, *Catania*, *Agosta*, *Noto*, *Caltagirone*, *Militello*; and in short, the same Cities and Castles which were miserably ruined by the two late violent Earthquakes of this present Year 1693.

The first of which was at Five a Clock the next Night after the 9th. of *January*. Its Motion was of that sort which *Aristotle* and *Pliny* call the First Species, and is by them likened to the shaking Fit of an *Ague*, causing such a motion as shakes the Earth from side to side. In this first almost all the Edifices in the Country were thrown down, whereof some were very high, and strong built Towers. A great part of the City of *Catania*, with many other was demolisht, and a great many Buildings in *Val di Noto*. *Syracusa* was also much shattered, but not ruined. This was not preceded by any darkness in the Air, but a pleasing serene warm time, which was the more observable, as being unusual at that time of the Year, yet it was not to any excess.

Some Persons which the Evening before were Travelling in the Country, observed a great Flame or Light, at about an *Italian* Mile's distance, and so bright, that they took it for a real Fire made by some of the Country People; and though they went directly towards it, yet it seemed to keep at the same distance from them. Whilst they were observing of this Appearance the Earth-

quake began, which was sensible even to the Horses they rode upon, that were affrighted thereat, and the Trees were all shaken. Upon this the amazed Travelers looking for the Light they saw just before, found it quite vanished. We perceived, turning towards the Sea, that the Waves which before the shake only beat gently upon the Shoar, began now to make a dreadful noise. The next day, which was the 10th. the Night and Day following, the Air was overshadowed with Darkness, and tinged with a deep yellow, and the obscured Sun struck our Minds with the Melancholy Pre-
 sage of the approaching Earthquake: Which was the Second, and happened on the 11th. of the same January about the 21st. hour, and lasted about Four Minutes. It was much like the second sort, which *Aristotle* and *Pliny* call a Pulse or stroke, from its resemblance to the beating of an Artery. And by *Possidonius* in *Seneca*, is represented by the Name of Vibrations, it being a Perpendicular lifting up of the Earth, as *Pontanus* describes it,

*Dubio nunc verberare subter
 Quassari aut sursum sublato pondere ferri.*

So horrid and amazing a shake was at once over all *Sicily*, of which it left, if not destroyed, yet at least every part miserably shaken. Its impulse was so vehement and powerful, that not only many Cities and Countries of the Kingdom of *Naples*, but the Island of *Malta* participated also of its fury. It was in this Country impossible to keep upon our Legs, or in one place on the dancing Earth; nay, those that lay along on the Ground, were tossed from side to side, as if on a rolling Billow.

In open places the Sea sunk down considerably, and in the same proportion in the Ports and inclosed Bays, and the Water bubbled up all along the shore.

The Earth opened in several places in very long clefts, some an hands breadth, others half a Palm, others like great Gulfs. From those openings that were in the Valleys, such a quantity of Water sprung forth as overflowed a great space of Ground, which to those that were near it, had a sensible Sulphureous smell, though in a low degree, and without that unpleasant stinking produced by the smoak of Brimstone.

In the Plain of *Catania*, an open place, it is reported, that from one of these Clefts, narrow, but very long, and about Four Miles off the Sea, the Water was thrown forth altogether as Salt as that of the Sea.

In the City of *Noto* is a Street of half a Mile long, built of Stone, which at present is settled into the Ground, and quite hanging on one side, like a Wall that inclines; and in another Street before the Assent *del Durbo*, is an Opening big enough to swallow a Man and Horse.

Great Rocks were loosened and thrown down from the Mountains every where. And in the Country of *Sortino*, inhabited by about 5000 Persons, a great number perished in the Houses which were beaten down by them in their way, as they rolled down from the Hills.

This Accident had its Effect on the Earth it self, for there happened to be a great Cistern, or Reservatory of Water hollowed on the top of a Rock, which was loosened and thrown off from the rest of the Rock, and slid down to the bed of the River that runs in the bottom, where the Cistern remains as it was full of the same Water it had received before the Earthquake.

A very great many Grotto's made by Art or Nature, are now fallen in.

In *Syracusa* and other places near the Sea, the Water in many Wells, which at first were salt, are become

fresh again, and have not as yet lost their Goodness, so that they are still fit to drink.

The Fountain *Arethusa* for the space of some Months was so brackish, that the *Syracusans* could make no use of it, and now that it is grown sweeter, its Spring is increased to near double.

In the City of *Termini* all the Running Waters are dried up, and amongst the rest a small River near to it, with which they watered their Gardens and Orchards. It was contrary with the hot Baths, which were augmented by a third part of what they were before the Earthquake.

In many plain and level places very high Walls leaped from their Foundations above two Paces, leaving that whole space perfectly clear and free from Rubbish and Ruines, as if they had been taken up and carryed off. And in *Syracuse* two Side-walls of a small Houe jump'd up from each other, the one upright, and stood upon its bottom at a great distance from its former place; and the other leaving its Companion, flew away so as to make an Angle with the other, to the wonder of the beholders of so extravagant an Accident.

Not far from the Country of *Cassaro*, from the tops of two Mountains, between which through a long Valley ran a River, two very great Rocks were loosened, which tumbling down over against each other, met so exactly, as to close up the Valley, and stop the Current of the River, which not finding any subterraneous or side-passage, has filled up the Valley to the top of the Rocks that were thrown down, and runs over them, forming a Lake three Miles round of a considerable depth.

In the Territory of *Sortini*, in a piece of Ground half a Mile long, but much narrower, the Ground at several little Interstices is sunk from the level, in some places two, in others three Palms, and ends in a very deep Circular Gulf or Swallow. A

A Fountain in the very Minute of the Earthquake on the 11th. threw forth its Waters tinged of a Blood-red, which continued for three hours, and then it dried up, leaving many holes in the Mud at the bottom, through which real Ashes were thrown out, and the next day the Waters returned of the former quality, without the least alteration.

In the City encompassed with Caves on three sides, although by the considerable shakes that were given it, there was not much Ruines made, yet a very dreadful sound and noise was heard for a great while.

The South Winds have blown very much, which still have been impetuous in the most sensible Earthquakes, and the like has happened at other times.

From the 11th. of *January* to this 14th. of *September* there have been considerable and strong South Winds, preceded by a noise like Cannon at a great distance, some of a longer, some a shorter continuance; this has been observed in all Parts, but louder in cavernous places, and in the Valleys between the Mountains, where the shakes were more violent, in proportion to the distance from the Sea.

Darkness and Obscurity of the Air has always been over us, but still inferior to that on the 10th. and 11th. of *January*; and often these Clouds have been thin and light, and of a great extent, such as Authors call *Raræ Nubeculae*. The Sun often, and the Moon always obscured at the Rising and Setting; and the Horizon all day long dusky, so that our wonted Prospects are shortned; but for some little time past it has grown something clearer.

To the no small trouble of the South Winds, has been joyned the unusual Weather. The Heat indeed at the beginning of the Summer has not been extream, but the Sun entring *Virgo*, it grew very great, and at Noons intolerable.

Since the first of *August*, which was a most Tempestuous Day, not only for the excessive Rains for about four hours, but for the Hail and very loud Thunder, the shakes of the Earthquake have been less sensible and seldomer, and for two Months not so Universal, but sometimes in one place, sometimes in another.

It has been observed, that in less solid Ground, such as Chalk, Sand, or loose Earth, the Mischiefs was without comparison greater than in Rocky places. And in *Syracusa* the difference was visible in three places; that is, in the middle of the City, in the little Island, and in *Zaracati*, where the Ancient *Syracusa* stood; in all which places the Buildings being on a Rocky Foundation, remain for the most part untouched, or only shaken, or at least not quite demolisht: Whereas on the contrary, in the rest of that Territory which is not Rocky, a very great Number of Noble Structures and Towers lye like a horrid Desert, and heap of vast Ruines.

The Effects it has had on Humane Bodies (although I do not believe they have all immediately been caused by the Earthquake) have (yet) been various; such as *Foolishness*, but not to any great degree, *Madness*, *Dulness*, *Sottishness*, and *Stolidity* every where: *Hypochondriack*, *Melancholick*, and *Cholerick* Distempers. Every day Fevers have been common, with many Continual and Tertian: Malignant, Mortal, and Dangerous ones in a great Number, with *Deliria* and *Lethargies*. Where there has been any Infection caused by the Natural Malignity of the Air, infinite Mortality has followed. The Small-Pox has made great Destruction amongst Children. And in short, there has been no State nor Condition which has not had its share in so Universal a Calamity.

The Number of the former Inhabitants of the Cities and Countries in Sicilia, that were destroyed either wholly or in part by the Earthquake, as likewise of those that perished therein.

	The Number of the People before the Earthquake.	The Num- ber of those killed.
In <i>Agosta</i>	6173	2300
<i>S. Agata</i>	1402	20
<i>Avola</i>	6225	800
<i>Buscema</i>	2192	900
<i>Bonaccorso</i>	844	94
<i>Bontello</i>	172	2
<i>Butera</i>	3492	
<i>Buccheri</i>	3295	300
<i>Caltagirone</i>	12339	800
<i>Catania</i>	18914	18000
<i>Comiso</i>	5305	269
<i>Castel di Jaci</i>	331	32
<i>Carleontini</i>	2751	77
<i>Cassaro</i>	1458	15
<i>Chiaramonte</i>	4830	303
<i>Floridia</i>	1037	20
<i>Ferla</i>	3610	800
<i>Fenicia Moncada</i>	1651	14
<i>Francofonte</i>	2039	345
<i>Giarlatana</i>	2981	541
<i>Mascale</i>	1300	15
<i>Massa Nunziata</i>	394	55
<i>Militello Val di Noto</i>	6438	600
<i>S. Michele</i>	1838	1
<i>Melilli</i>	5480	900
<i>Monterosso</i>	234	232
<i>Modica</i>	18203	3400

In Mazzarino

	The Number of the People before the Earthquake.	The Num- ber of those killed.
In Mazzarino	7696	
<i>Nicolosi</i>	844	4
<i>Nixemi</i>	1483	
<i>Noto</i>	12043	3000
<i>Occhiola</i>	2910	100
<i>S. Giovanni Lapunta</i>	1082	15
<i>Jaci Realé</i>	12895	739
<i>Jaci S. Antonio</i>	6363	1335
<i>Leontini</i>	10063	1212
<i>Licodia</i>	4898	741
<i>Mineo</i>		1355
<i>Palagonia</i>	1862	29
<i>Pedara</i>	1582	475
<i>Palazzolo</i>	5571	700
<i>Ragusa</i>	9946	5000
<i>Sortino</i>	6316	2500
<i>Syracusa</i>	15399	4000
<i>Scicili</i>	9382	2000
<i>Scordia</i>	907	33
<i>Spaccafurno</i>	7987	2200
<i>Trezza</i>		200
<i>Trecastagni</i>	3264	1000
<i>Terranova</i>	5289	
<i>Tremisteri</i>	996	90
<i>Vittoria</i>	3950	200
<i>Terra grande & Via grande</i>	1602	200
<i>Vizzini</i>	10678	2000
In all	254936	59963